

Apollo VP3 PCIset

P55VP3

ISA/PCI/AGP MainBoard

with Onboard PCI IDE and Super Multi-I/O.

TRADEMARK

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The specification is subject to change without notice.

V043

Read me first

1. The "LOAD SETUP DEFAULTS" function loads the system default data directly from ROM and initializes the associated hardware properly. This function is necessary when you accept this mainboard, or the system CMOS data will corrupt.

ROM PC/ISA BIOS CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP/PCI CONFIGURATION INTEGRATED PERIPHERALS LOAD SETUP DEFAULTS	SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SETUP SAVING ↑ ↓ → ← SELECT ITEM (Shift)F2 Change Color
Load Setup Defaults Except Standard CMOS SETUP	

LOAD SETUP DEFAULT

2. **KBPO (KeyBoard Power On) Function**: There is a basic requirement that the "+5V SB" power of the ATX power supply must be $\geq 0.1A$ (100mA). Please refer to chapter 2-5 for detail.

Package Checklist

**Please check your package which should include all items listed below.
If you find any item damaged or missed, please contact your supplier.**

- One mainboard
- One manual
- One IDE ribbon cable
- One floppy ribbon cable
- One AGP driver diskette
- One Ultra_DMA IDE driver diskette

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Chapter 1

Introduction

The P55VP3 mainboard is a high performance system hardware based on Intel Pentium® processor and is equipped with an AGP slot, four PCI slots, three standard ISA slots, Super Multi-I/O controller and dual port PCI-IDE connectors for the future expansion. The hardware dimension is 305mm x 210mm with a four-layer design technology.

Specification

- ◆ VIA Apollo VP3 AGP/PCI set chipset.
- ◆ Intel Pentium® Processor, Pentium Processor with MMX Technology, AMD K5/K6 & Cyrix 6x86/6x86L/6x86MX operating at 90~333MHz with 321 ZIF socket 7 provides scalability to accept faster Processors in the future.
- ◆ Supports up to 384 MegaBytes of memory (168-Pin DIMM x3, 72-Pin SIMM x2).
- ◆ Supports 512KB (Pipelined Burst SRAM) L2 Cache.
- ◆ Supports three 16 bit ISA slots, four 32 bit PCI slots and an AGP slot and provides two independent high performance PCI IDE interfaces capable of supporting PIO Mode 3/4 and Ultra-DMA33 devices.
- ◆ Supports ATAPI (e.g. CD-ROM) devices on both IDE interfaces.
- ◆ Supports a floppy port, a parallel port (EPP/ECP port), two serial ports (16550 Fast UART compatible), 1 USB Connector, a PS/2 style mouse connector and an AT style keyboard connector.
- ◆ Supports Award Plug & Play BIOS.
- ◆ Supports CPU Hardware sleep, APM (Advanced Power Management) and ACPI (Advanced Configuration Power Interface).
- ◆ Supports an ATX power supply connector for a Remote On/Off, a Phone-Ring Power On and a Keyboard Power On Function.
- ◆ Supports Switching Regulator for CPU power supply and single jumper for CPU working voltage selection.
- ◆ Supports ESSJ (Easy Setting Single Jumper) function for CPU selection.

Chapter 2

Hardware design

2-1 Mainboard Layout

The P55VP3 is designed with VIA Apollo VP3 AGP/PCIsset chipset which is developed by VIA Corporation to fully support Pentium® Processor PCI/ISA system. By providing a massive increase in the bandwidth available between the video card and the processor (66MHz), the unique feature of AGP supported by VIA Apollo VP3 chipset improves the speed of rendering and texturing for 3D graphics. The chipset also provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard devices, CD-ROM device, etc). The Winbond WB3877F Super I/O controller provides the standard PC I/O function: one floppy interface, two 16 Byte FIFO serial ports and one EPP/ECP capable parallel port. The P55VP3 layout is shown in the next page for user's reference. Care must be taken when inserting memory modules, CPUs or even plugging PCI card into associated slots to avoid damaging any circuits or sockets on board. A cooling fan is strongly recommended when installing Pentium/Pentium MMX/K5/K6/6x86/6x86L/6x86MX processor due to possible overheat.

The P55VP3 supports a minimum of 8MB and a maximum of 384MB of System Memory while Onboard 512KB cache to increase system performance.

The P55VP3 supports standard Fast Page, EDO (Extended Data Out or Hyper Page Mode) or synchronous DRAM. **The P55VP3** provides three 168-pin DIMM sites for memory expansion. The sockets support 1M x 64(8MB), 2M x 64(16MB), 4M x 64(32MB), and 8M x 64(64MB) single-sided or double-sided memory modules. The memory timing requires 70 ns Fast page devices or 60 ns EDO DRAM. (DRAM Modules may be parity [x 36] or non-parity [x 32].

The P55VP3 supports two Onboard PCI IDE connectors, and automatically detects IDE harddisk type by BIOS utility automatic.

The P55VP3 supports Award Plug & Play BIOS for the ISA and PCI cards. The BIOS can be located in Flash EPROM which can replace BIOS code easily if necessary.

P55VP3 Layout

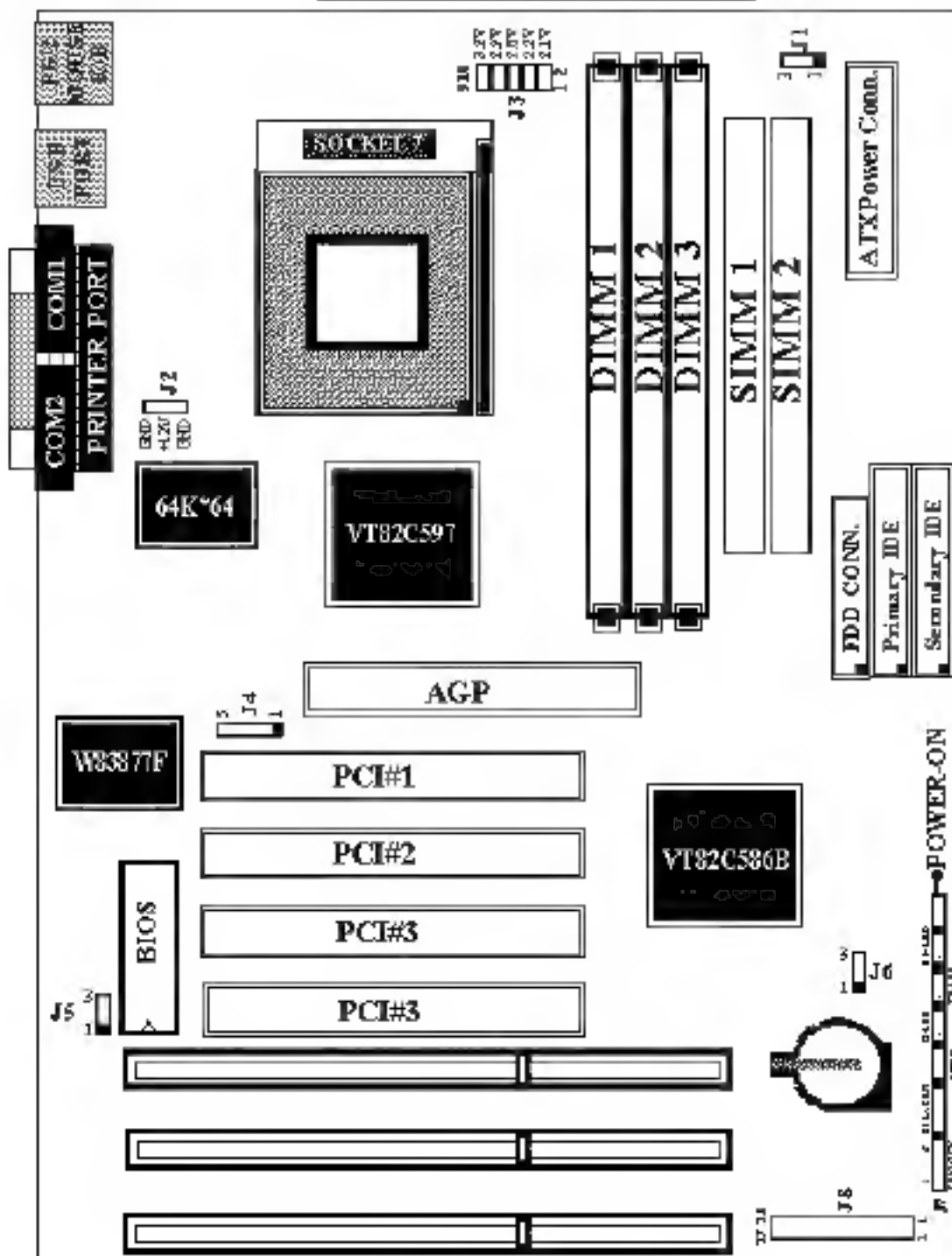



Figure 2-1


2-2 Connectors and Jumpers

This section describes the connectors and jumpers equipped in the mainboard. Please refer to **Figure 2-1** for the location of each connector and jumper.




J8		CPU	Pentium Pentium/MMX AMD K5/K6	Bus Frequency x Multiplier	Cyrix 6x86(L) / 6x86MX IBM 6x86(L) / 6x86MX
	1 2 27 28	1-2	100MHz	66MHz x 1.5	
		3-4	120MHz	60MHz x 2	6x86/L-PR150
		5-6	133MHz	66MHz x 2	6x86/L/MX-PR166
		7-8		75MHz x 2	6x86/L/MX-PR200
		9-10	150MHz	60MHz x 2.5	6x86MX-PR166
		11-12	166MHz	66MHz x 2.5	6x86MX-PR200
		13-14	188MHz	75MHz x 2.5	* 6x86MX-PR233
		15-16	200MHz	66MHz x 3	* 6x86MX-PR233
		17-18	225MHz	75MHz x 3	* 6x86MX-PR266
		19-20	233MHz	66MHz x 3.5	* 6x86MX-PR266
		21-22	* 266MHz	66MHz x 4	
		23-24	* 300MHz	66MHz x 4.5	
		25-26	* 333MHz	66MHz x 5	
		27-28	90MHz	60MHz x 1.5	

* These jumper settings are reserved for the future CPUs versions. When the future CPUs are ready and suitable for this mainboard, these jumper settings will be correctly updated.

J3 : CPU Vcore voltage selection : For Pentium Processor with MMX technology, AMD K6 and Cyrix 6x86L/6x86MX

		1-2	: 2.1V Reserved
1 2 9 10		3-4	: 2.2V Reserved for AMD K6 CPUs in the future
		5-6	: 2.8V for Pentium MMX and Cyrix 6x86L
		7-8	: 2.9V for AMD K6-PR2-166/200MHz and Cyrix 6x86MX
		9-10	: 3.2V for AMD K6-PR2-233/266MHz

Note : J3 is for Vcore Settings of dual voltage CPUs. Please ignore the settings of single voltage CPUs. Such as Intel Pentium Processor, AMD K5, Cyrix M1 and its C6 here.

J4		IrDA/ASK IR CONNECTOR 1.VCC 2.NC 3.IRRX 4.GND 5.IRTX
J2		The Power Supply (+12V) of the CPU Cooling FAN 1.GND 2.+12V 3.GND
J7		KeyLock - Keyboard lock switch & Power LED connector 1.Power LED(+) 2.N/C 3.GND 4.Keylock 5.GND Speaker - connect to the system's speaker for beeping. 1.Speaker 2.N/C 3.GND 4.GND Reset Switch - Closed to restart system. Power Saving LED indicator - LED ON when system is in any Saving mode. Turbo LED indicator - LED ON when higher speed is selected. # There is no deturbo function so that the turbo LED is always ON. IDE LED indicator - LED ON when Onboard PCI IDE Harddisks activate. Power-ON - Push the button to turn on the system. - Pressing less than 4 seconds to enter the suspend mode - Pressing more than 4 seconds to turn off the system

2-3 System Memory Configuration

The P55VP3 supports different type of settings for the system memory. The following figures and table provides all possible memory combinations.



DIMM1 or SIMM 1&2 BANK0	DIMM2 BANK1	DIMM3 BANK2	TOTAL Memory
<div> <div>8MB</div> <div>16MB</div> <div>32MB</div> <div>64MB</div> <div>128MB</div> </div> <div>OR</div> <div> <div>8MB</div> <div>16MB</div> <div>32MB</div> </div> <div>x 1</div> <div>x 2</div>	<div> <div>8MB</div> <div>16MB</div> <div>32MB</div> <div>64MB</div> <div>128MB</div> </div> <div>x 1</div>	<div> <div>8MB</div> <div>16MB</div> <div>32MB</div> <div>64MB</div> <div>128MB</div> </div> <div>x 1</div>	MAX= 384MB

*** NOTE 1 : DIMM 1 and SIMM 1&2 are shared (BANK0)**

This means that if you use DIMM 1 you can not use SIMM 1&2 or if you use SIMM 1&2 you can not use DIMM 1.

NOTE 2 : The KEY ZOOM of the DIMM socket is 3.3V / Unbuffered.



2-4 ATX Power ON/OFF Control

The P55VP3 equips an ATX power connector which is a single 20-PIN input device for an ATX power supply (see Figure 2-2). An ATX power supply provides a built-in Remote Power ON/OFF function. To implement the function, a momentary switch which is normally open should be connected to the position J7(PIN 24, 25) as the system's power ON/OFF button. Note that an AT power supply does not offer this function.

Based on the ATX power connector, the P55VP3 has been designed to support both *ACPI* and *Soft OFF functions*. According to the definition of *ACPI*, a *Suspend mode* will be enabled when you push the J7(system power ON/OFF) button less than 4 seconds. Nevertheless, the system will be turned off by pressing for more than 4 seconds. Regarding the Soft OFF coming from the P55VP3 onboard circuit controller, it is another way to turn off your system. Your system can be shut down automatically by an operation system such as Windows 95.

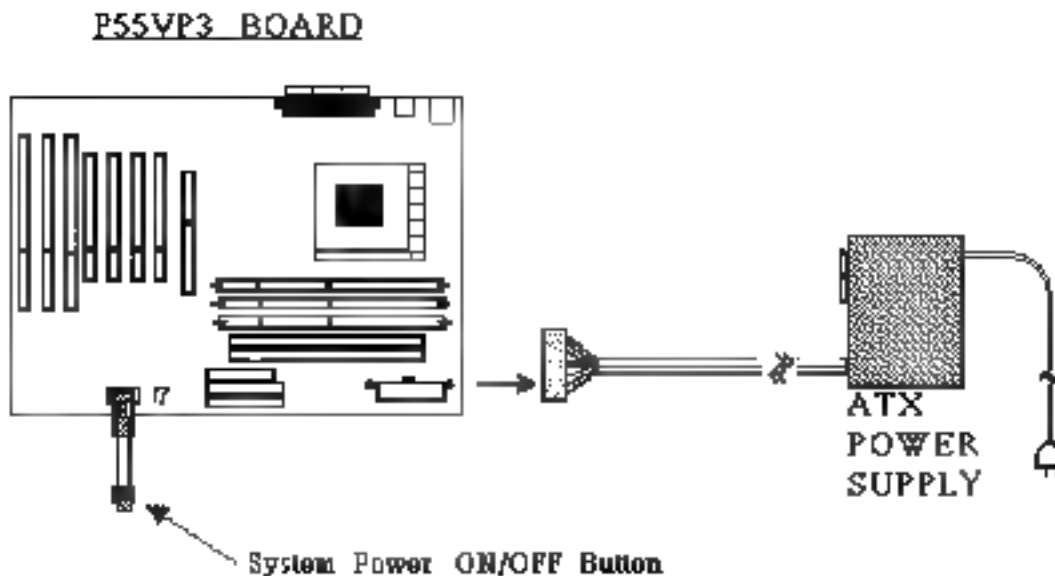


Figure 2-2. Simple ATX Power ON/OFF Controller

2.5 External Modem Ring-in Power ON and Keyboard Power ON

Function

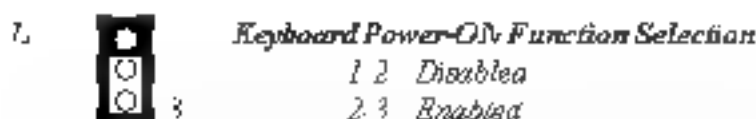
On the basis of bounded functions in I/O chipset, the two serial ports are able to support the External Modem Ring-in Power ON function. Once users connect the external modem to COM1 or COM2, the P55VP3 mainboard allows users to turn on their system through the remote and host's dial-up control.

Exclusive Keyboard Power ON Function

To innovate a unique feature to benefit users, we devoted ourselves to create the easiest and most convenient way to turn on your system based on the the ATX power supply. This function is available only under system being connected to ATX power supply.

How to work with it

Step 1. Please place J₁ at the position 2-3 after you finished the system installation.



Step 2. Push the momentary switch to turn on your system and then push again to hold for more than 4 seconds to turn it off as soon as you turn it on.

Step 3. You can enjoy the Keyboard Power ON function by pressing any 1 or 2 keys on your keyboard at the same time for 1-2 seconds. Your system will be turned on automatically after releasing the keys. To power off your system, you can use the Soft-Off function under Windows 95.

Notes

The number of keys needed to turn on a system depends on the model of keyboard you are applying due to different loadings on different keyboards. Here, we would like to suggest you push 2 keys at the same time.

2. Intel ATX version 2.0 specification has recommended you use the power supply with 0.72A(720mA). With our P55VP3 mainboard, the 5.0VSB standby power only has to be $\geq 0.1A$ (100mA), then you can enjoy this unique benefit. However, the ATX power supply which is $< 0.1A$ (100mA), is still applicable to your system by placed J₁ at the position 1-2 to disable this feature.

2.6 Integrated PCI Bridge

The **P55VP3** utilizes **VIA Apollo VP3 PCIset** chipset to support Intel Pentium® Processor PCI/ISA system. The VIA Apollo VP3 PCIset chipset consists of the 82C597 system controller (TSC) and one 82C586B PCI/ISA/IDE Accelerator bridge chip. It provides an interface which translates CPU cycle into PCI bus cycle and PCI burst read/write capability. In addition, it provides high performance PCI arbiter to support four PCI Masters, Rotating Priority Mechanism, and Hidden Arbitration Scheme. Minimizes Arbitration Overhead.

There are four interrupts in each PCI slot: INTA#, INTB#, INTC#, and INTD#. Since the **P55VP3** adapts the PCI auto configuration with the system BIOS Setup utility. When the system is turned on after adding a PCI add-in card, the BIOS automatically configure interrupts, DMA channels, I/O space, and other parameters. You do not have to configure jumpers or worry about potential resource conflicts. Because PCI cards use the same interrupt resource as ISA cards, you must specify the interrupt used by ISA add-in cards in the BIOS Setup utility.

However, if a "Legacy" card, such as plugging a paddle card and cable into an ISA slot is plugged in the system, modification in the **ROM SETUP UTILITY** becomes necessary. First of all, you must enter **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu to set "ISA" for the "PCI IDE IRQ MAP TO

Secondly, you must enter the **CHIPSET FEATURES SETUP UTILITY** from the **ROM SETUP UTILITY** main menu and set "Disabled" for the "Onboard Primary PCI IDE" and the "Onboard Secondary PCI IDE". When you plug PCI/ISA/IDE cards into the system, You should select "Disabled" for the **Onboard Primary and Secondary PCI IDE** from the **CHIPSET FEATURES SETUP UTILITY** too.

You can set the system interrupt request (IRQ) on some "Legacy" cards which have on paddle card and cable refer to user's manual of the card to a proper system IRQ level. (In general, card's Primary is assigned to INTA and Secondary is assigned to INTB. If the card is plugged into slot marked PCI#1, you cannot use second slot marked PCI#2) because the Secondary INT signal takes INTB from the slot. refer to Page 3-12 for circuit diagram). The user then enters the **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu and set "PCI-Slot" for the "PCI IDE IRQ MAP TO" (This depends on the slot # where the Legacy card is plugged).

CHAPTER 3

AWARD BIOS SETUP

Award's ROM BIOS provides a built-in setup program which allows user to modify the basic system configurations and hardware parameters. The modified data will be stored in a battery-backed CMOS RAM so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stays unchanged unless there is a configuration change in the system, such as a hard drive replacement or a new device installation.

If this does happen, you will need to reconfigure your configuration parameter

To Enter Setup Program

Power on the computer and press key immediately. This will bring you into BIOS
CMOS SETUP UTILITY

```

ROM BIOS (2A5LEPA9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP      SUPERVISOR PASSWORD
BIOS FEATURES SETUP      USER PASSWORD
CHIPSET FEATURES SETUP   IDE HDD AUTO DETECT ON
POWER MANAGEMENT SETUP   HDD LOW LEVEL FORMAT
PNP/PCI CONFIGURATION    SAVE & EXIT SETUP
INTEGRATED PERIPHERALS   EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS

ESC Quit                ↑ ↓ ← →  Select Item
F10 Save & Exit Setup   Shift+F2 Change Color

Time, Date, Hard Disk Type

```

Figure 3-1 CMOS SETUP UTILITY

The menu displays all major selection items. Select the item you need to reconfigure. The selection is made by moving cursor (press any direction key) to the item and press the Enter key. An on-line help message is displayed at the bottom of the screen as the cursor is moving to various items which provides a better understanding of each function. When a selection is made the menu of selected item will appear so the user can modify the associated configuration parameters.

3-1 STANDARD CMOS SETUP

Choose 'STANDARD CMOS SETUP' in the CMOS SETUP UTILITY Menu (Fig 3). The STANDARD CMOS SETUP allows user to configure system setting such as the current date and time, type of hard disk installed, floppy type and display type. Memory size is auto detected by the BIOS and displayed for your reference. When a field is highlighted, use direction keys to move cursor and <Enter> key to select; the entries in the field will be changed by pressing <PgDn> or <PgUp> keys or user can enter new data directly from the keyboard.

ROM PCI/ISA BIOS(2A51EPAD)									
STANDARD CMOS SETUP									
AWARD SOFTWARE, INC.									
Date mm/dd/yy		Wed, Apr 17 1997							
Time (hh:mm:ss)		4:30:50							
HARD DISKS	TYPE	SIZE	CYL	HEAD	PRECOMP	LANDZONE	SECTORS	MODE	
Primary Master	Auto	0	0	0	0	0	0	Auto	
Primary Slave	Auto	0	0	0	0	0	0	Auto	
Secondary Master	Auto	0	0	0	0	0	0	Auto	
Secondary Slave	Auto	0	0	0	0	0	0	Auto	
Drive A: 40M 95m					Base Memory: 640K Extended Memory: 15360K Other Memory: 984K <hr/> Total Memory: 16394K				
Drive B: None									
Floppy 3 mode Support: Disable									
Video: EGA/VGA									
Halt On: All Errors									
ESC: Quit		↑ ↓ → ←		Select Item		PU/PD: Modify			
F: Help		(Shift) F2		Change Color					

Figure 3-2 STANDARD CMOS SETUP

NOTE: If the Primary Master/Slave and the Secondary Master/Slave are set as Auto, the hard disk size and model will be auto-detected.

NOTE: The "Halt On" field is to determine when to halt the system by the BIOS if an error occurs.

3-2 BIOS FEATURES SETUP

By selecting the 'BIOS FEATURES SETUP' option in the CMOS SETUP UTILITY menu, user can change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values of the P55VP3. Again, user can move the cursor by pressing direction keys and <PgDn> or <PgUp> keys to modify the parameters. Pressing [F1] key to display help message of the selected item.

- ◆ **Quick Power On Self Test:** This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enabled, BIOS will shorten or skip some checking items during POST.

Enabled Enable quick POST

Disabled Normal POST
- ◆ **Boot Sequence:** This category determines which drive is searched first for the O/S (Operating System). The default value is A,C.

A,C The system will search for floppy disk drive first then hard disk drive

C,A The system will search for hard disk drive first then floppy disk drive
- ◆ **Swap Floppy Drive:** This will swap your physical drive letters A&B if you are using two floppy disks. The default value is Disabled.

Enabled Floppy A & B will be swapped under the O/S

Disabled Floppy A & B will be not swapped
- ◆ **Boot Up Floppy Seek:** During Power-On Self Test (POST), BIOS will determine if the installed floppy drive is 40 or 80 tracks. Only 360K type is 40 tracks while 720K, 1.2M and 1.44M are all 80 tracks. The default value is Enabled.

Enabled BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS cannot tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.

Disabled BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.
- ◆ **Boot Up NumLock Status:** The default value is On.

On Keypad is number keys

Off Keypad is arrow keys
- ◆ **Boot UP System Speed:** Select default system speed. The system will run at the selected speed after the system boots.

High Set the speed to high

Low Set the speed to low
- ◆ **Gate A20 Option:** This refers to the way the system addresses memory above 1MB (extended memory). The default value is Fast.

Normal The A20 signal is controlled by keyboard controller or chipset hardware

Fast The A20 signal is controlled by Port 92 or chipset specific method

- **Typematic Rate Setting:** This determines the typematic rate.
 - Enabled:* Enable typematic rate and typematic delay programming.
 - Disabled:* Disable typematic rate and typematic delay programming. The system BIOS will use default value of 20 terms and the default is controlled by the keyboard.
- **Typematic Rate(Chars/Sec):**

6: 6 characters per second.	8: 8 characters per second.
10: 10 characters per second.	12: 12 characters per second.
15: 15 characters per second.	20: 20 characters per second.
24: 24 characters per second.	30: 30 characters per second.
- **Typematic Delay(Msec)** This determines the time between the first and second character displayed, when holding a key.
 - 250: 250msec
 - 500: 500msec
 - 750: 750msec
 - 1000: 1000msec
- **Security Option** This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup.
 - System* The system will not boot and the access to Setup will be denied if the correct password is not entered at the prompt.
 - Setup* The system will boot, but the access to Setup will be denied if the correct password is not entered at the prompt.
- **PCI/VGA Palette Snoop** This field controls the ability of a primary PCI VGA controller to share a common palette (when a snoop write cycles with an ISA video card). The default value is Disabled.
 - Enabled* If an ISA card connects to a PCI VGA card via the VESA connector and the ISA card connects to VGA monitor and uses the RAMDAC of PCI card, the PCI/VGA Palette Snoop is enabled.
 - Disabled:* Disable the VGA card Palette snoop function.
- **Video BIOS Shadow** It determines whether video BIOS will be copied to RAM. However, it is optional from chipset design. Video Shadow will increase the video speed.
 - Enabled* Video shadow is enabled.
 - Disabled* Video shadow is disabled.

- C8000 CBFFF Shadow
- CC000 CFFFF Shadow
- D0000 D3FFF Shadow
- D4000 D7FFF Shadow
- D8000 DBFFF Shadow
- DC000 DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per unit and the size depends on the chipset.

Enabled Optional shadow is enabled.

Disabled Optional shadow is disabled.

3-3 CHIPSET FEATURES SETUP

Choose the 'CHIPSET FEATURES SETUP' in the CMOS SETUP UTILITY menu to display the following menu.

ROM PCI/ISA BIOS(2A5LEPA9) CHIPSET FEATURES SETUP AWARD SOFTWARE, INC.	
Bank 0/1 DRAM Timing	60 ns
Bank 2/3 DRAM Timing	60 ns
Bank 4/5 DRAM Timing	60 ns
SDRAM Cycle Length	2
SDRAM Bank Interleave	2 Bank
DRAM Read Pipeline	Enabled
Sustained BT Write	Enabled
Cache Rd+CPU Wr Pipeline	Enabled
Read Around write	Enabled
Cache Timing	Fast
Video BIOS Cacheable	Enabled
System BIOS Cacheable	Disabled
Memory Hole At 1Mb Addr	Disabled
AGP	Enabled
Aperture Size	64M
AGP-2X Mode	Enabled

Esc	Quit	↑ ↓	← →	Select Item
F1	Help	PU/PD/++		Modify
F5	Old Values	Shift/F2		Color
F7	Load Setup Default			

Figure 3-4 CHIPSET FEATURES SETUP

Note: When you insert slower memory modules in the system and set a faster timing, maybe the system will hang up.

- **DRAM Timing:** The default value is 60ns.
60ns : 2 (faster) Burst Wait State, for 60~70ns Fast Page Mode/EDO DRAM.
70ns : 3 (slower) Burst Wait State, for 70ns Fast Page Mode/EDO DRAM
- **Video BIOS Cacheable:** The default value is Enabled.
Enabled : Enabled the Video BIOS Cacheable to speed up the VGA Performance
Disabled : Disabled the Video BIOS Cacheable function.
- **Memory Hole at 15M-16M:** The default value is Disabled
Disabled : Normal Setting
Enabled : This field enables the main memory (15~16MB, remap to ISA BUS).

3.4 POWER MANAGEMENT SETUP

Choose the "POWER MANAGEMENT SETUP" in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it is absolutely necessary.

ROM BIOS(AWARD BIOS(2A5LEPA9)) POWER MANAGEMENT SETUP AWARD SOFTWARE, INC.			
Power Management:	User Define	Primary/IRTE:	ON
PM Control by APM:	Yes	IRQ3 (COM 2)	Primary
Video off Option:	Suspend -> OFF	IRQ4 (COM 1)	Primary
Video off Method:	VB SYNC + Blank	IRQ5 (LPT 2)	Primary
Conserve Mode:	Disabled	IRQ6 (Floppy Disk)	Disabled
Modem Use IRQ:	3	IRQ7 (LPT)	Primary
Soft-off by PWREBTN:	Delay 4 Sec	IRQ8 (RTC Alarm)	Disabled
↔ EM Timers ↔		IRQ9 (IRQ2 Radio)	Primary
HDD Power Down:	Disable	IRQ 0 (Reserved)	Primary
Doze Mode:	Disable	IRQ 1 (Reserved)	Primary
Suspend Mode:	Disable	IRQ 2 (PS/2 Mouse)	Primary
** PM Events **		IRQ 3 (Coprocessor)	Primary
VGA:	OFF	IRQ 4 (Hard Disk)	Primary
LPT & COM:	LPT/COM	IRQ 5 (Reserved)	Disabled
HDD & FDD:	OFF		
DMA Master:	OFF	Esc Quit	↑ ↓ ← → Select Item
Modem Ring Resume:	Disabled	F1 Help	PU/PD+/- Modify
RTC Alarm Resume:	Disabled	F5 Old Values	Shift/F2 Color
		F7 Load Setup Defaults	

Figure 3-5 POWER MANAGEMENT SETUP

Again, users can move the cursor by pressing direction keys to the field needed to be modified and press <PgDn> or <PgUp> to alter item selection. You can only change the content of **Doze Mode**, **Standby Mode** and **Suspend Mode** when the **Power Management** is set to **User Define**.

3.3.1 The Description of the Power Management

A. Power Management mode selection

Disabled The system operates in NORMAL conditions (Non-GREEN) and the Power Management function is disabled.

Max. saving: This mode will maximize the power saving capability.

Min. saving: This mode will minimize the power saving capability.

User define: Allow user to define time-out parameters to control power saving mode. Refer to item B shown below.

B. Time-out parameters

HDD Standby

HDD Standby timer can be set from 1 to 15 minute(s).

System Doze

The "System Doze" mode timer starts to count when there is no "PM events" occurred. The valid time-out setting is from 1 minute up to 1 hour.

System Suspend

This function works only when the Pentium Processor is installed. The timer starts to count when "System Standby" mode timer is timed out and no "PM Events" occurred. Valid range is from 1 minute up to 1 hour.

3.3.2 Description of the Green Functions

The P55VP3 supports HDD Power Down, Doze and Suspend power saving functions. In addition, the hardware suspend function is supported when the J7(24,25) (Refer to Figure2-1) is closed to enter the Suspend function.

The detailed description of these functions is provided in the next page.

HDDStandbyMode

When system stops reading or writing HDD, the timer starts to count. The system will cut off the HDD power when timer runs out of time. The system will not resume operation until either a read from or a write to HDD command is executed again.

DozeMode

The system hardware will drop down CPU clock from normal working speed when Doze mode time-out occurs.

SuspendMode

When the system suspend timer times out, the system will enter the suspend mode and the chipset will stop CPU clock immediately. The power consumption in Suspend Mode is lower than in standby mode. The screen is also blanked out.

PMEvents

AWARD BIOS defines 7 PM Events in the power management mode (Doze & suspend). The user can initialize any PM Events to be "Enable" or "Disable". When the system detects all of the enabled events do not have any activity, it will start the system Doze timer first. If the "Power Management" is not "Disabled", Once the system Doze timer is timed out, it will process doze power saving procedure by starting the system suspend timer. When the suspend timer times out, all of the CPU clock will stop by dropping system clock down to zero and remains this way until any one of the "Enabled" event occurs.

3.5 PNP/PCI CONFIGURATION

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots.

WARNING: Any misplacing IRQ could cause system can't pick out the resources.

ROM PCI/ISA BIOS(2ASLEPA0) PNP/PCI CONFIGURATION AWARD SOFTWARE, INC.			
PNP installed	No	CPL to PCI Write Buffer	Enabled
Resources Controlled By	Manual	PCI Dynamic Bursting	Enabled
Reset Configuration Data	Disabled	PCI Master DIPS Write	Enabled
		PCI Delay Transaction	Enabled
IRQ-3 assigned to	Legacy ISA	PCI Master Read Prefetch	Enabled
IRQ-4 assigned to	Legacy ISA	PCI#2 Access #1 Retry	Disabled
IRQ-5 assigned to	PCI/ISA PnP	AGP Master LWS Write	Enabled
IRQ-7 assigned to	Legacy ISA	AGP Master LWS Read	Disabled
IRQ-9 assigned to	PCI/ISA PnP		
IRQ-10 assigned to	PCI/ISA PnP	PCI IRQ Activated By	Level
IRQ-11 assigned to	PCI/ISA PnP	PCI IDB IRQ Map To	PCI_AJT0
IRQ-12 assigned to	PCI/ISA PnP	Primary DELINT#	A
IRQ-14 assigned to	Legacy ISA	Secondary IDE INT#	B
IRQ-15 assigned to	Legacy ISA		
DMA-0 assigned to	PCI/ISA PnP		
DMA-1 assigned to	PCI/ISA PnP		
DMA-3 assigned to	PCI/ISA PnP		
DMA-5 assigned to	PCI/ISA PnP		
DMA-6 assigned to	PCI/ISA PnP		
DMA-7 assigned to	PCI/ISA PnP		
		ESC Quit	↑ ↓ ← → Select Item
		F1 Help	PLUS/Minus Modify
		F5 No Change	(Shift) F2 Color
		F7 Load Setup Defaults	

Figure 3-6 PCI CONFIGURATION SETUP

◆ **Resource Controlled By:** The default value is Manual.

Manual: The field defines that the PNP Card's resource is controlled by manual. You can setup whether IRQ X or DMA X is assigned to PC/ISA PNP or Legacy ISA Cards.

Auto: If your ISA card and PCI card are all PNP cards. Set this field to 'Auto'. The BIOS will assign the interrupt resource automatically.

◆ **Reset Configuration Data:** The default value is Disabled.

Disabled: Normal Setting.

Enabled: If you plug some Legacy cards on the system and record into ESCD (Extended System Configuration Data). You can set this field to be Enabled and to clear ESCD at one time when some Legacy cards are removed.

◆ **PCI IDE IRQ Map To:** The default value is PCI AUTO.

When you have true PCI cards plugged into the system, you will not need to change anything here in the SETUP program. However, if you do not know whether you are using a true PCI card, please refer to your PCI card user's manual for the details.

When you have a Legacy card described in section 2.5 to plug into the system, a proper setting is extremely important or it may cause the system hung up. The diagram shown below tells you how the Rotating Priority Mechanism is designed.

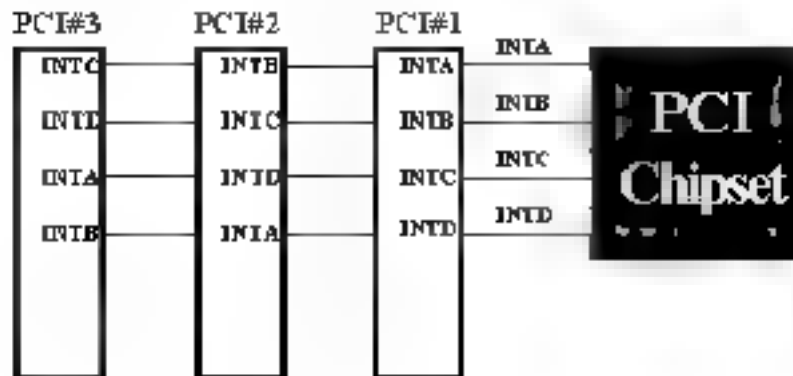


Figure 3-7 The Combination of PCI INT# lines

3-6 INTEGRATED PERIPHERALS

ROM PCVISA BIOS(2A5LEPA9) INTEGRATED PERIPHERALS WARD SOFTWARE, INC.			
Onboard Primary PCI IDE	Enabled	Onboard Parallel Port	378 IRQ7
Onboard Secondary PCI IDE	Enabled	Onboard Parallel Mode	ECP EPP
IDE Prefetch Mode	Enabled	EPP Mode Use DMA	1
IDE HDD Block Mode	Enabled	Parallel Port EPP Type	EPP-9
IDE primary Master PIO	Auto	OnChip J5B	Disabled
IDE Primary Slave PIO	Auto		
IDE Secondary Master PIO	Auto		
IDE Secondary Slave PIO	Auto		
IDE Primary Master UDMA	Auto		
IDE Primary Slave UDMA	Auto		
IDE Secondary Master UDMA	Auto		
IDE Secondary Slave UDMA	Auto		
PCI IDE Secondary Channel	Enabled		
Onboard FDD Controller	Enabled	ESC Quit	Select Item
Onboard Serial Port	Auto	F1 Help	PU/PD(A) Modify
Onboard Serial Port 2	Auto	F5 No Change	Shift F2 Color
JART 2 Mode	Standard	F7 Load Setup Defaults	

Note: If you don't use the Onboard IDE connector, but use On-card (PCI or ISA card) IDE connector. You have to set Onboard Primary PCI IDE: Disabled and Onboard Secondary PCI IDE: Disabled from CHIPSET FEATURES SETUP utility.

The Onboard PCI IDE cable should be equal to or less than 18 inches (45 cm.).

- IDE HDD Block Mode:** The default value is Enabled.
 - Enabled** Enabled IDE HDD Block Mode. The HDD transfer rate is better than Disabled.
 - Disabled:** Disable IDE HDD Block Mode.
- PCI Slot IDE 2nd Channel:** The default value is Enabled.
 - Enabled** Enable secondary IDE port and BIOS will assign IRQ 5 for this port.
 - Disabled** Disable secondary IDE port and IRQ 5 is available for other device.
- Onboard Primary PCI IDE:** The default value is Enabled.
 - Enabled** Enable Onboard 1st channel IDE port.
 - Disabled** Disable Onboard 1st channel IDE port. When use On-card (PCI or ISA card) IDE connector.
- Onboard Secondary PCI IDE:** The default value is Enabled.
 - Enabled** Enable Onboard 2nd channel IDE port.
 - Disabled** Disable Onboard 2nd channel IDE port. When use On-card (PCI or ISA card) IDE connector.

- **IDE Primary Master PIO:** The default value is *Auto*
 - Auto* BIOS will automatically detect the Onboard Primary Master PCI IDE HDD Accessing mode
 - Mode 0~4* Manually set the IDE Accessing mode
- **IDE Primary Slave PIO:** The default value is *Auto*
 - Auto* BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode
 - Mode 0~4* Manually set the IDE Accessing mode
- **IDE Secondary Master PIO:** The default value is *Auto*
 - Auto* BIOS will automatically detect the Onboard Secondary Master PCI IDE HDD Accessing mode
 - Mode 0~4* Manually set the IDE Accessing mode
- **IDE Secondary Slave PIO:** The default value is *Auto*
 - Auto* BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode
 - Mode 0~4* Manually set the IDE Accessing mode
- **Onboard FDC Controller:** The default value is *Enabled*
 - Enabled* Enable the Onboard SMC CHIP's floppy drive interface controller
 - Disabled* Disable the Onboard SMC CHIP's floppy drive interface controller
When using On-card ISA FDC's controller
- **Onboard UART 1:** This field allows the user to select the serial port. The default value is 3F8H/IRQ4
 - COM1:* Enable Onboard Serial port 1 and address is 3F8H/IRQ4
 - COM2:* Enable Onboard Serial port 1 and address is 2F8H/IRQ3
 - COM3:* Enable Onboard Serial port 1 and address is 3E8H/IRQ4
 - COM4:* Enable Onboard Serial port 1 and address is 2E8H/IRQ3
 - Disabled:* Disable Onboard SMC CHIP's Serial port 1
- **Onboard UART 2:** This field allows the user to select the serial port. The default value is 2F8H/IRQ3
 - COM1:* Enable Onboard Serial port 2 and address is 3F8H/IRQ4
 - COM2:* Enable Onboard Serial port 2 and address is 2F8H/IRQ3
 - COM3:* Enable Onboard Serial port 2 and address is 3E8H/IRQ4
 - COM4:* Enable Onboard Serial port 2 and address is 2E8H/IRQ3
 - Disabled:* Disable Onboard SMC CHIP's Serial port 2

- **Onboard UART 2 Mode** The default value is standard. This field allows the User to select the COM2 port that can support a serial Infrared Interface.

Standard: Support a Serial Infrared Interface IrDA

HPSTR: Support a HP Serial Infrared Interface format

ASKIR: Support a Sharp Serial Infrared Interface format

- **Onboard Parallel port:** This field allows the user to select the LPT port. The default value is 378H/IRQ7.

378H Enable Onboard LPT port and address is 378H and IRQ7

278H Enable Onboard LPT port and address is 278H and IRQ5

3BCH Enable Onboard LPT port and address is 3BCH and IRQ7

Disabled Disable Onboard LPT port

NOTE: Parallel Port address is 378H/3BCH that selects the routing of IRQ7 for LPT1.
Parallel Port address is 278H that selects the routing of IRQ5 for LPT1.

- **Parallel port Mode** This field allows the user to select the parallel port mode. The default value is ECP+EPP.

Normal Standard mode IBM PC AT Compatible bidirectional parallel port

EPP Enhanced Parallel Port mode

ECP Extended Capability Port mode

EPP+ECP ECP Mode & EPP Mode

ECP Mode USE DMA: This field allows the user to select DMA1 or DMA3 for the ECP mode. The default value is DMA3.

DMA1 The field selects the routing of DMA1 for the ECP mode

DMA3 The field selects the routing of DMA3 for the ECP mode

3.7 LOAD SETUP DEFAULTS

The "LOAD SETUP DEFAULTS" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary only when the system CMOS data is corrupted.

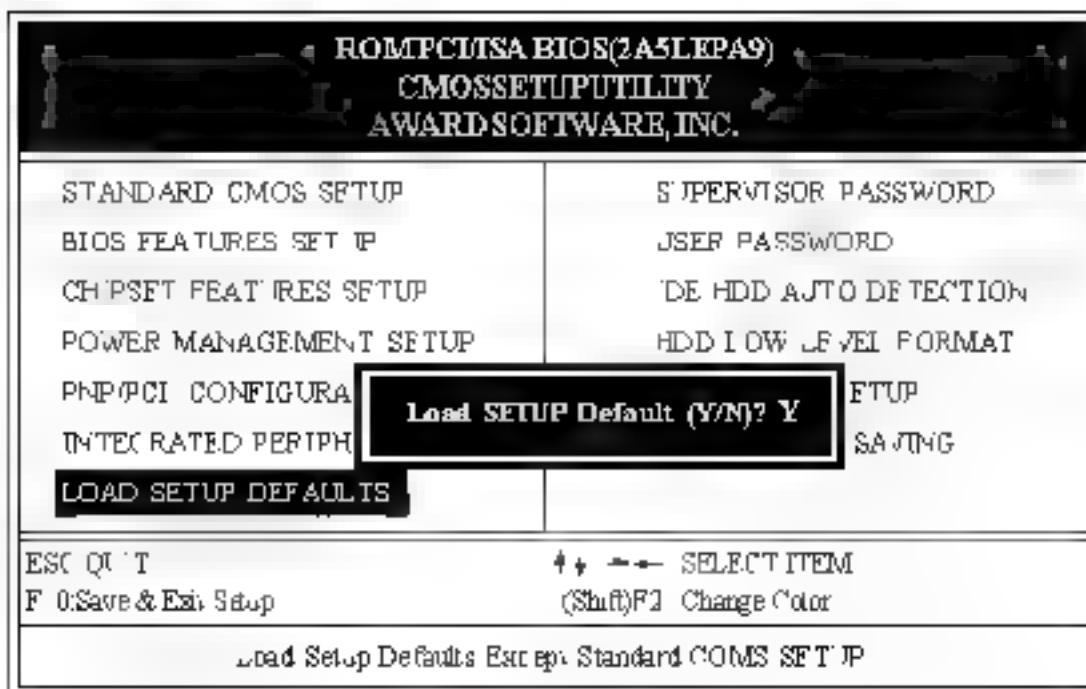


Figure 3-8 LOAD SETUP DEFAULT

3.8 CHANGE SUPERVISOR or USER PASSWORD

To change the password, choose the **'SUPERVISOR PASSWORD or USER PASSWORD'** option from the **CMOS SETUP UTILITY** menu and press **[Enter]**.

NOTE Either **"Setup"** or **"System"** must be selected in the **"Security Option"** of the **BIOS FEATURES SETUP** menu (Refer to Figure 3-3 for the details).

If CMOS is corrupted or the option is not used, a default password stored in the ROM will be used. The screen will display the following message:

Enter Password:

Press the **[Enter]** key to continue after proper password is given.

- If CMOS is corrupted or the option was used earlier and the user wish to change default password, the **SETUP UTILITY** will display a message and ask for a confirmation:

Confirm Password:

- After pressing the **[Enter]** key (ROM password if the option was not used) or current password (user defined password), the user can change the password and store new one in CMOS RAM. A maximum of 8 characters can be entered.

3.9 IDE HDD AUTO DETECTION

The "IDE HDD AUTO DETECTION" utility is a very useful tool especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. But now you can set **HARD DISK TYPE** to **Auto** in the **STANDARD CMOS SETUP**. You do not need the "IDE HDD AUTO DETECTION" utility. The BIOS will Auto-detect the hard disk size and model on display during POST.

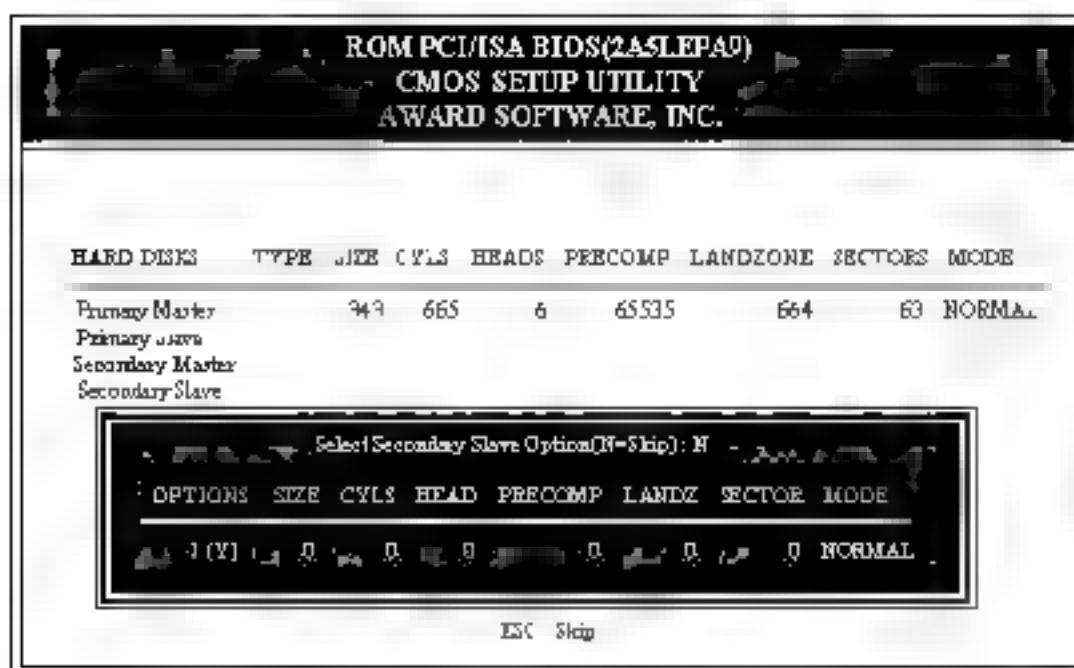


Figure 3-9 IDE HDD AUTO DETECTION

NOTE HDD Modes

The Award BIOS supports 3 HDD modes: NORMAL, LBA and LARGE NORMAL mode.

General access mode that is neither the BIOS nor the IDE controller will make transformations during accessing.

The maximum numbers of cylinders, head & sectors for NORMAL mode are 1024, 16 and 63.

no Cylinder	1024
x no Head	6
x no Sector	63
x no. per sector	512
528 Megabytes	

If an user sets the HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (Logical Block Addressing) mode: This is a new HDD accessing method to overcome the 528 Megabyte bottleneck.

The number of cylinders, heads and sectors shown in the setup may not be the number physically contained in the HDD.

During the HDD accessing, the IDE controller will transform the logical address described by sector, head and cylinder into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 Gigabytes which is obtained by the following formula:

$$\begin{array}{rcl}
 & \text{no Cylinder} & 1024 \\
 \times & \text{no Head} & 255 \\
 \times & \text{no Sector} & 63 \\
 \hline
 & \times \text{ bytes per sector} & 512 \\
 & \text{8.4 Gigabytes} &
 \end{array}$$

LARGE mode: This is an extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinders without LBA support. In some cases, user does not want LBA. The Award BIOS provides another alternative to support these kinds of LARGE mode.

CYLS.	HEADS	SECTOR	MODE
1120	6	59	NORMAL
560	12	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT 13h in order to access the right HDD address.

Maximum HDD size

$$\begin{array}{rcl}
 & \text{no Cylinder} & (1024) \\
 \times & \text{no Head} & 32 \\
 \times & \text{no Sector} & 63 \\
 \hline
 & \times \text{ bytes per sector} & 512 \\
 & 1.6 Gigabytes &
 \end{array}$$

Note

To support LBA or LARGE mode of HDDs, there must be some softwares involved. All softwares are located in the Award HDD Service Routine. NT 13h. It may fail to access a HDD with LBA (LARGE) mode selected, if you are running under an Operating System which replaces the whole NT 13h. UNIX operating systems do not support either LBA or LARGE and must utilize the Standard mode. UNIX can support drives larger than 528MB.

3-10 HDD LOW LEVEL FORMAT

Interleave

Select the interleave number of the hard disk drive that you wish to perform a low level format on. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for automatic detection.

Auto scan bad track

This allows the utility to scan first then format by each track.

Start

Press <Y> to start low level format.

3-11 SAVE & EXIT SETUP

The "SAVE & EXIT SETUP" option will bring you back to boot up procedure with all the changes you just recorded in the CMOS RAM.

3-12 EXIT WITHOUT SAVING

The "EXIT WITHOUT SAVING" option will bring you back to normal boot up procedure without saving any data into CMOS RAM. All old data in the CMOS will not be destroyed.

Chapter 4

Technical Information

4.1 I/O & MEMORY MAP

MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	5.12K	Conventional memory
[80000-9FBFF]	1.27K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	1.60K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-FFFFF]	60K	Available for IMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adaptor
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FED00-FFFFF]	8K	BIOS runtime service routine 1

I/O MAP

[000-01F]	DMA controller (Master)
[020-021]	INTERRUPT CONTROLLER (Master)
[022-023]	CHIPSET control registers I/O ports
[040-05F]	TIMER control registers
[060-06F]	KEYBOARD interface controller (8042)
[070-07F]	RTC ports & CMOS I/O ports
[080-09F]	DMA register
[0A0-0BF]	INTERRUPT controller (Slave)
[0C0-0DF]	DMA controller Slave
[0F0-0FF]	MATH COPROCESSOR
[1F0-1F8]	HARD DISK controller
[278-27F]	PARALLEL port 2
[2B0-2DF]	GRAPHICS adapter controller
[2F8-2FF]	SERIAL port 2
[360-36F]	NETWORK ports
[378-37F]	PARALLEL port
[3B0-3BF]	MONOCHROME & PARALLEL port adapter
[3C0-3CF]	EGA adapter
[3D0-3DF]	CGA adapter
[3F0-3F7]	FLIPPY DISK controller
[3F8-3FF]	SERIAL port 1

4.2 TIME & DMA CHANNELS MAP

TIME MAP	TIMER Channel 0	System timer interrupt
	TIMER Channel 1	DRAM REFRESH request
	TIMER Channel 2	SPEAKER tone generator
DMA CHANNELS	DMA Channel 0	Available
	DMA Channel 1	Onboard ECP (Option,
	DMA Channel 2	FLOPPY DISK (SMC CHIP)
	DMA Channel 3	Onboard ECP default
	DMA Channel 4	Cascade for DMA controller 1
	DMA Channel 5	Available
	DMA Channel 6	Available
	DMA Channel 7	Available

4.3 INTERRUPT MAP

NMI	Parity check error		
IRQ (H/W)	0	System TIMER interrupt from TIMER 0	
		KEYBOARD output buffer full	
	2	Cascade for IRQ 8- 5	
	3	SERIAL port 2	
	4	SERIAL port	
	5	PARALLEL port 2	
	6	FLOPPY DISK (SMC CHIP)	
	7	PARALLEL port 1	
	8	RTC clock	
	9	Available	
	0	Available	
	1	Available	
	2	PS/2 Mouse	
	3	MATH coprocessor	
	4	Onboard HARD DISK(IDE	channel
	5	Onboard HARD DISK(IDE2	channel

4.4 RTC & CMOS RAM MAP

RTC & CMOS	00	Seconds
	01	Second alarm
	02	Minutes
	03	Minutes alarm
	04	Hours
	05	Hours alarm
	06	Day of week
	07	Day of month
	08	Month
	09	Year
	0A	Status register A
	0B	Status register B
	0C	Status register C
	0D	Status register D
	0E	Diagnostic status byte
	0F	Shutdown byte
	10	FLOPPY DISK drive type byte
	11	Reserve
	12	HARD DISK type byte
	13	Reserve
	14	Equipment type
	15	Base memory low byte
	16	Base memory high byte
	17	Extension memory low byte
	18	Extension memory high byte
	19-2d	
	2E-2F	
	30	Reserved for extension memory low byte
	31	Reserved for extension memory high byte
	32	DATE CENTURY byte
	33	INFORMATION FLAG
	34-3F	Reserve
	40-7F	Reserved for CHIPSET SETTING DATA

APPENDIX A: POST CODES

ISA POST codes are typically output to port address 80h.

POST(hex) DESCRIPTION

01-02	Reserved
C0	Turn off OEM specific cache shadow
03	initialize EISA registers (EISA BIOS only) 2 initialize all the standard devices with default values. Standard devices includes: DMA controller (8237) Programmable interrupt Controller (8259) Programmable interval Timer (8254) RTC chip
04	Reserved
05	Keyboard Controller Self Test 2 Enable Keyboard interface
06	Reserved
07	Verifies CMOS's basic R/W functionality
C1	Auto detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000-FFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	OEM specific cache initialization, if needed
0A	initialize the first 32 interrupt vectors with corresponding Interrupt handlers Initialize INT no from 33-20 with Dummy 'Suprious' Interrupt Handler 2 Issue CPU ID instruction to identify CPU type 3 Early Power Management initialization (OEM specific)
0B	verify the RTC time is valid or not 2 Detect bad battery 3 Read CMOS data into BIOS stack area 4 PnP initializations including PnP BIOS only Assign CSN to PnP ISA card Create resource map from ESCD 5 Assign IO & Memory for PCI devices (PCI BIOS only)

POST(hex) DESCRIPTION

00	Initialization of the BIOS Data Area (40:00-40:FF)
0D	Program some of the Chipset's value according to Setup (Early Setup Value Program) 2 Measure CPU speed for display & decide the system clock speed 3 Video initialization including Monochrome (CGA, EGA/VGA). If no display device found, the speaker will beep.
0E	Test video RAM (if Monochrome display device found) 2 Show messages including: Award Logo, Copyright string, BIOS Data code & Part No. OEM specific sign on messages Energy Star Logo (Green BIOS ONLY) CPU brand, type & speed Test system BIOS checksum (Non-Compress Version only)
0F	DMA channel 0 test
10	DMA channel 1 test
11	DMA page registers test
12-13	Reserved
14	Test 8254 Timer 0 Counter 2
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved
1E	(if EISA NVM checksum is good, execute EISA initialization (EISA BIOS only))
1F-20	Reserved
21	Detect Base Memory & Extended Memory Size
31	Test Base Memory from 256K to 640K 2 Test Extended Memory from 1M to the top of memory

POST(hex) DESCRIPTION

32	Display the Award Plug & Play BIOS Extension message (PnP BIOS only) 2 Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port according to setup value
33-3B	Reserved.
3C	Set flag to allow users to enter CMOS Setup Utility
3D	Initialize Keyboard 2 Install PS/2 mouse
3E	Try to turn on Level 2 cache Note: Some chipset may need to turn on the L2 cache in this stage. But usually the cache is turn on later in POST 6.h.
3F-40	Reserved.
BF	Program the rest of the Chipset's value according to Setup Utility Setup Value Program. 2 If auto-configuration is enabled, programmed the chipset with pre-defined values
41	Initialize floppy disk drive controller
42	Initialize Hard drive controller
43	If it is a PnP BIOS, initialize serial & parallel ports
44	Reserved.
45	Initialize math coprocessor
46-4D	Reserved.
4E	If there is any error detected, such as video kb .., show all the error messages on the screen & wait for user to press <F2> key
4F	If password is needed, ask for password 2 Clear the Energy Star Logo (Green BIOS only)
50	Write all CMOS values currently in the BIOS storage area back into the CMOS
51	Reserved.

POST(hex) DESCRIPTION

- 52** 1 Initialize all ISA ROMs
 2 Later PC initializations (PC BIOS only)
 - assign IRQ to PC devices
 - initialize all PCI ROMs
 3 PnP initializations (PnP BIOS only)
 - assign IO Memory IRQ & DMA to PnP ISA devices
 - initialize all PnP ISA ROMs
 4 Program shadows RAM according to Setup settings
 5 Program parity according to Setup setting
 6 Power Management initialization
 - Enable/Disable global PM
 - APM interface initialization
- 53** 1 If it is NOT a PnP BIOS, initialize serial & parallel ports
 2 Initialize time value in BIOS data area by translate the RTC time value into a timer tick value
- 60** Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting
- 61** 1 Try to turn on Level 2 cache
 Note: If L2 cache is already turned on in POST 3D this part will be stopped
 2 Set the boot up speed according to Setup setting
 3 Last chance for Chipset initialization
 4 Last chance for Power Management initialization (Green BIOS only)
 5 Show the system configuration table
- 62** 1 Setup daylight saving according to Setup value
 2 Program the NUMALock typematic rate & typematic speed according to Setup setting.
- 63** 1 If there is any changes in the hardware configuration, update the ESCD information (PnP BIOS only)
 2 Clear memory that have been used
 3 Boot system via INT 19H
- FF** System Booting. This means that the BIOS already pass the control right to the operating system

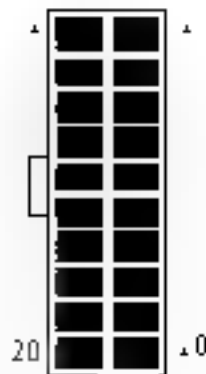
Unexpected Errors:

POST(hex) DESCRIPTION

- E0** firmware occurs in protected mode
- E1** Unclaimed NMI occurs

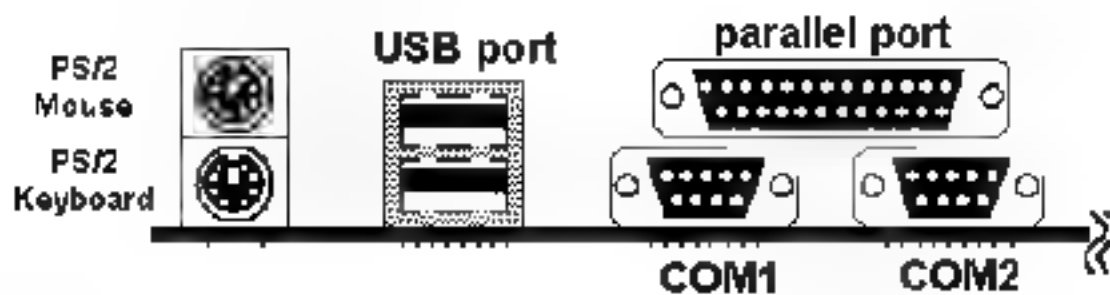
APPENDIX B: CONNECTORS

ATX Power Supply Connector:

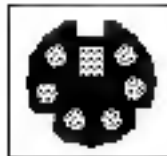


Signal Name	Pin	Pin	Signal Name
3.3V	1	1	3.3V
2.0V	2	2	3.3V
GND	3	3	GND
PS-ON	4	4	5.0V
GND	5	5	GND
GND	6	6	5.0V
GND	7	7	GND
5.0V	8	8	PW OK
5.0V	9	9	5VSB
5.0V	20	20	2.0V

I/O back panel connector:

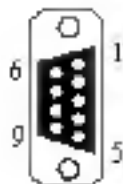


CN1 : PS/2 KEYBOARD & MOUSE CONNECTOR:



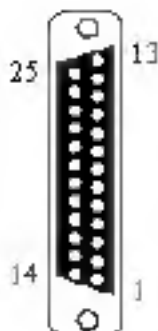
Pin	Signal Name
1	Data
2	Clock
3	GND
4	NC
5	VCC

CN3/COM1,CN5/COM2 : Serial Ports Connector

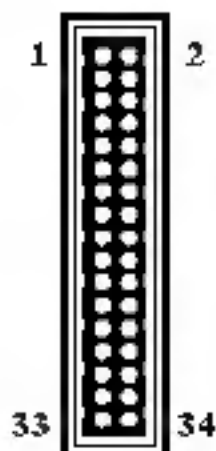


Signal Name	Pin	Pin	Signal Name
DCD	1	6	DSR
SIN	2	7	RTS
SOUT	3	8	CTS
DTR	4	9	RI
GND	5		

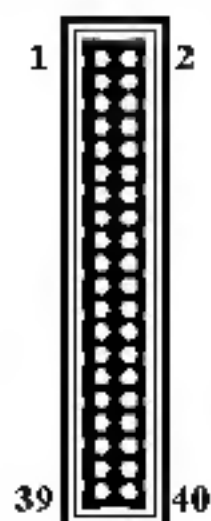
CN4 : Parallel Port Connector



Signal Name	Pin	Pin	Signal Name
STROBE-	1	14	AUTO FEED-
Data Bit 0	2	15	ERROR-
Data Bit 1	3	16	INIT-
Data Bit 2	4	17	SLCT IN-
Data Bit 3	5	18	Ground
Data Bit 4	6	19	Ground
Data Bit 5	7	20	Ground
Data Bit 6	8	21	Ground
Data Bit 7	9	22	Ground
ACJ-	10	23	Ground
BUSY	11	24	Ground
PE	12	25	Ground
SLCT	13		

CN7 : Floppy Disk Connector

Signal Name	Pin	Pin	Signal Name
Ground	1	2	FDHDIN
Ground	3	4	Reserved
Ground	5	6	FDEDIN
Ground	7	8	Index-
Ground	9	10	Motor Enable
Ground	11	12	Drive Select B-
Ground	13	14	Drive Select A-
Ground	15	16	Motor Enable
Ground	17	18	DIR-
Ground	19	20	STEP-
Ground	21	22	Write Data
Ground	23	24	Write Gate
Ground	25	26	Track 00-
Ground	27	28	Write Protect-
Ground	29	30	Read Data-
Ground	31	32	SIDE 1 SELECT-
Ground	33	34	Diskette

CN8/CN9 : Primary, Secondary IDE Connector

Signal Name	Pin	Pin	Signal Name
Reset IDE	1	2	Ground
Host Data 7	3	4	Host Data 8
Host Data 6	5	6	Host Data 9
Host Data 5	7	8	Host Data 10
Host Data 4	9	10	Host Data 11
Host Data 3	11	12	Host Data 12
Host Data 2	13	14	Host Data 13
Host Data 1	15	16	Host Data 14
Host Data 0	17	18	Host Data 15
Ground	19	20	Key
DRQ3	21	22	Ground
I/O Write-	23	24	Ground
I/O Read-	25	26	Ground
IOCHRDY	27	28	BALE
DACK3-	29	30	Ground
IRQ14	31	32	IDCS16-
Addr 1	33	34	Ground
Addr 0	35	36	Addr 2
Chip Select 0-	37	38	Chip Select 1-
Activity	39	40	Ground

Appendix C: AGP Driver for Win95 Installation Guide

● Requirement

- _Microsoft Windows 95 OSR2.1 (OSR2.0 with USB upgrade)
- _*Apollo VP3 AGP Driver (Vgart.VXD)*
- _AGP VGA Card with Driver
- _Direct X5 DDK or SDK

● Installation Procedure

- Step 1. Install windows 95 4.00.950 B or later version
- Step 2. Install Usbsupp (USB upgrade)
- Step 3. Install Apollo VP3 AGP Driver
- Step 4. Install VGA driver for windows 95
- Step 5. Install Microsoft Direct X5 DDK or SDK

Note :

1. To make sure if the Apollo VP3 AGP driver is properly installed, one must boot the system up and run "Regedit" to check if the following path with VIAGART exists.
"HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\VxD"
2. To check if the AGP driver is able to activate, one must do the following.
 - 1) activate "Control Panel,"
 - 2) click "Direct X,"
 - 3) click "DirectDraw," and
 - 4) check if there are some values in "Bit" and "Overlays." If there are some values, the AGP is able to activate.

idt C6 CPUs setting

CPU J8	<i>idt C6</i>		Bus Frequency x Multiplier
1-2			
3-4	DS120		60MHZ x 2
5-6	DS133		66MHZ x 2
7-8			
9-10			
11-12			
13-14			
15-16	DS200	DS180	66/60MHZ x 3
17-18	DS225		75MHZ x 3
19-20			
21-22	DS266	DS240	66/60MHZ x 4
23-24			
25-26		DS300	60MHZ x 5
27-28	OFF	ON	